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1966 OPERATING SUMMARY

# **GODERICH**

**water**  
**treatment**  
**plant**

TD227  
G64  
W38  
1966  
MOE

c.1  
a aa

ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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ONTARIO WATER RESOURCES COMMISSION  
OFFICE OF THE GENERAL MANAGER

Members of the Goderich Local Advisory Committee,  
Town of Goderich.

Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the  
Goderich Water Treatment Plant, OWRC Project No. 60-W-69.

It is hoped that our joint participation in efforts to protect your water  
supply will have even more success in the coming year.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly", is written over the typed name.

D. S. Caverly,  
General Manager.

TD  
227  
G64  
W38  
1966  
MOE

asye



ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

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J. H. H. ROOT, M.P.P.  
VICE-CHAIRMAN

D. S. CAVERLY  
GENERAL MANAGER

W. S. MACDONNELL  
COMMISSION SECRETARY

General Manager,  
Ontario Water Resources Commission.

Dear Sir:

I am happy to present you with the 1966 Operating Summary for the Goderich Water Treatment Plant, OWRC Project No. 60-W-69.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

A handwritten signature in cursive script, appearing to read "B. C. Palmer".

B. C. Palmer, P. Eng.,  
Director,  
Division of Plant Operations.

## FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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# **GODERICH**

## **water treatment plant**

operated for

THE TOWN OF GODERICH

by

THE ONTARIO WATER RESOURCES COMMISSION

---

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Assistant Director:	C. W. Perry
Regional Supervisor:	A. C. Beattie
Operations Engineer:	P. J. Osmond

801 Bay Street

Toronto 5



# '66 REVIEW

The average daily flow of 0.741 million gallons was less than the 1965 average of 0.775 million gallons. The flows have been dropping slightly each year since 1963. This may be due to a combination of lawn watering restrictions and weather conditions.

The treated water quality was excellent throughout the year and met OWRC standards at all times.

The quality of the raw water was generally good. However, periods of high turbidity occur due to adverse lake currents caused by high winds and high river flows. A slight colour problem was noted originating from the Maitland River on one occasion. Problems in pump plugging due to weeds have been encountered. Heavy algae concentrations reduce the filter runs during some periods.

## OPERATING COSTS

The operating costs were in proportion to the type and capacity of the plant. The cost per gallon has increased because of lower output and increased operating costs.

## EQUIPMENT

All equipment was maintained in excellent condition during the year and equipment failures were quickly repaired when they occurred. A new program of preventive maintenance with top priority assigned to essential equipment was instituted. Spare parts will be stockpiled for the top priority equipment. Outside help was called in for repair to the diesel generating system and the flow metering system.

## PROJECT STAFF

The plant is supervised 24 hours per day, seven days per week, with each man working an average of 40 hours per week. The permanent staff of five is supplemented by casual labour to cover for vacations, sick leave and heavy work load periods. A total of 5.6 men are required to give the plant full coverage with two men at the plant on the day shift only, five days of the week.

The staff maintained a clean, attractive and efficient plant for the Town of Goderich. Special attention is always given to good public relations and many visitors toured the plant during the year.

# PROJECT COSTS

## NET CAPITAL COST (Final):

Goderich Town..... \$708,196.02

Deduct payments from municipality	<u>15,000.00</u>	\$693,196.02
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Ontario Hospital..... \$293,383.05

Deduct payments from Ontario Hospital	<u>293,383.05</u>	-
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Long Term Debt to OWRC	<u>\$693,196.02</u>
------------------------	---------------------

## Debt Retirement Balance at Credit (Sinking Fund) December 31, 1966

Goderich Town	\$ 62,920.03	
Ontario Hospital	<u>-</u>	<u>\$ 62,920.03</u>

## BILLINGS

The total cost to the municipality during 1965 was as follows:

### Net Operating

Goderich Town	\$ 42,321.50	
Ontario Hospital	<u>2,477.38</u>	\$ 44,798.88

### Debt Retirement

Goderich Town	\$ 14,037.00	
Ontario Hospital	<u>-</u>	\$ 14,037.00

### Reserve

Goderich Town	\$ 5,683.51	
Ontario Hospital	<u>298.21</u>	\$ 5,981.72

### Interest Charged

Goderich Town	\$ 38,862.71	
Ontario Hospital	<u>107.70 CR</u>	<u>\$ 38,754.92</u>

TOTAL	<u><u>\$103,572.52</u></u>
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RESERVE ACCOUNT

	<u>Total</u>	<u>Ontario Hospital</u>	<u>Town of Goderich</u>
Balance January 1, 1966	\$18,736.27	\$1,221.82	\$19,958.09
Add: Payments in 1966	<u>5,683.51</u>	<u>298.21</u>	<u>5,981.72</u>
	\$24,419.78	\$1,520.03	\$25,939.81
Add: Interest earned on Reserve Funds in 1966	<u>1,167.76</u>	<u>67.40</u>	<u>1,235.16</u>
Balance at Credit December 31, 1966	<u><u>\$25,587.54</u></u>	<u><u>\$1,587.43</u></u>	<u><u>\$27,174.97</u></u>

## MONTHLY OPERATING COSTS

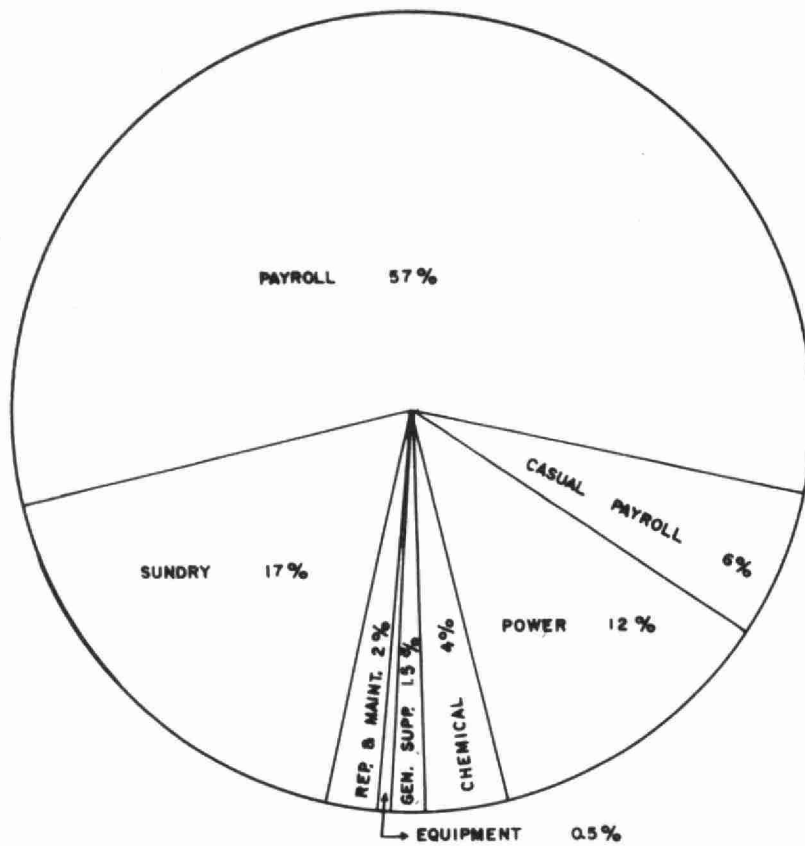
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY
JAN	2508.03	1848.15	133.76	470.47		27.00			28.65
FEB	2597.02	1761.02	230.56	526.12		30.20	20.32	4.25	24.55
MARCH	2704.47	1922.00	142.56	479.46		106.22	5.47	21.91	26.85
APRIL	3984.07	2906.45	158.40	466.05	198.75	53.49	16.90	131.18	52.85
MAY	3104.52	2273.23	126.72	416.34		52.26	99.75		136.22
JUNE	9140.93	2075.80	190.08	368.14		96.82	2.38		6407.71
JULY	3343.36	1877.69	276.99	425.33	578.09	32.46	23.00	104.83	24.97
AUG	2993.80	2034.65	396.19	474.46		26.59		46.02	15.89
SEPT	4365.04	2929.96	316.37	393.77	198.75	59.64	20.68	409.89	35.98
OCT	3696.09	2026.38	157.97	360.69		48.97		187.81	914.27
NOV	2770.96	1966.45	253.27	427.71		59.06	9.10	23.78	31.59
DEC	3590.59	2004.05	348.54	424.99	601.46	77.00		16.17	118.38
TOTAL	44798.88	25625.83	2731.41	5233.53	1577.05	669.71	197.60	945.84	7817.91

## YEARLY OPERATING COSTS

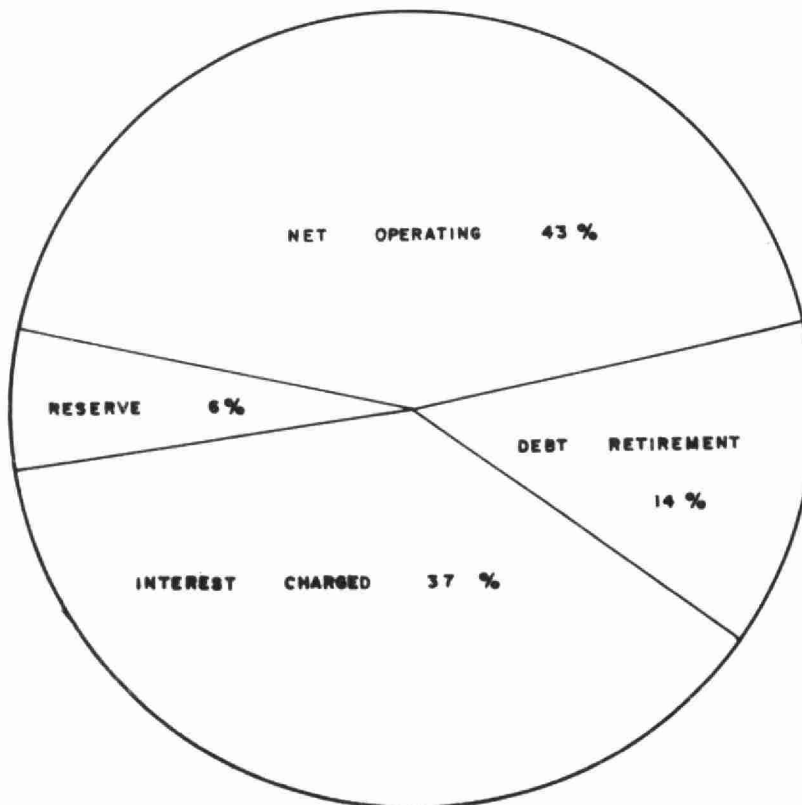
YEAR	M. G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER THOUSAND GALLONS
1963	305,271	\$ 30,397	* \$ 17.82	\$ 0.10
1964	293,962	\$ 36,979	\$ 21.64	\$ 0.13
1965	283,003	\$ 39,935	\$ 23.36	\$ 0.14
1966	270,556	\$ 44,799	\$ 26.64	\$ 0.17

\* BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

## 1966 OPERATING COSTS



## TOTAL ANNUAL COST



## Process Data

### FLOWS

The average daily output of .741 million gallons was less than the average daily output in 1965 of 0.775 million gallons. The 1964 and 1963 averages were 0.805 and 0.835 MGD respectively showing a trend to lower consumption each year. This is probably the result of a combination of lawn watering restrictions and cool summer weather. The peak month average has decreased yearly from 1.34 MGD in 1963 to 1.18 MGD in 1966. The summer peak was approximately 1 1/2 times the average daily flow for the year. The maximum day flow of 1.643 MG was less than 4 times the minimum day at .432 MG. From Graph No. 2, it is shown that the design flow of 1.5 MGD was only exceeded 1% of the time. The load factor is 0.495.

Backwashing of the filters accounts for an average use of 5% of the total raw water pumped to the plant.

### TURBIDITIES

Graph No. 3, shows turbidities for the four years of operation. The trend is to high raw water turbidities in the winter and spring and low values during the summer and fall. There is also a low turbidity period when the lake is ice covered around the end of February each year.

The turbidity of the filtered water is normally below 1 ppm and is much less than the OWRC maximum allowable value of 5 ppm.

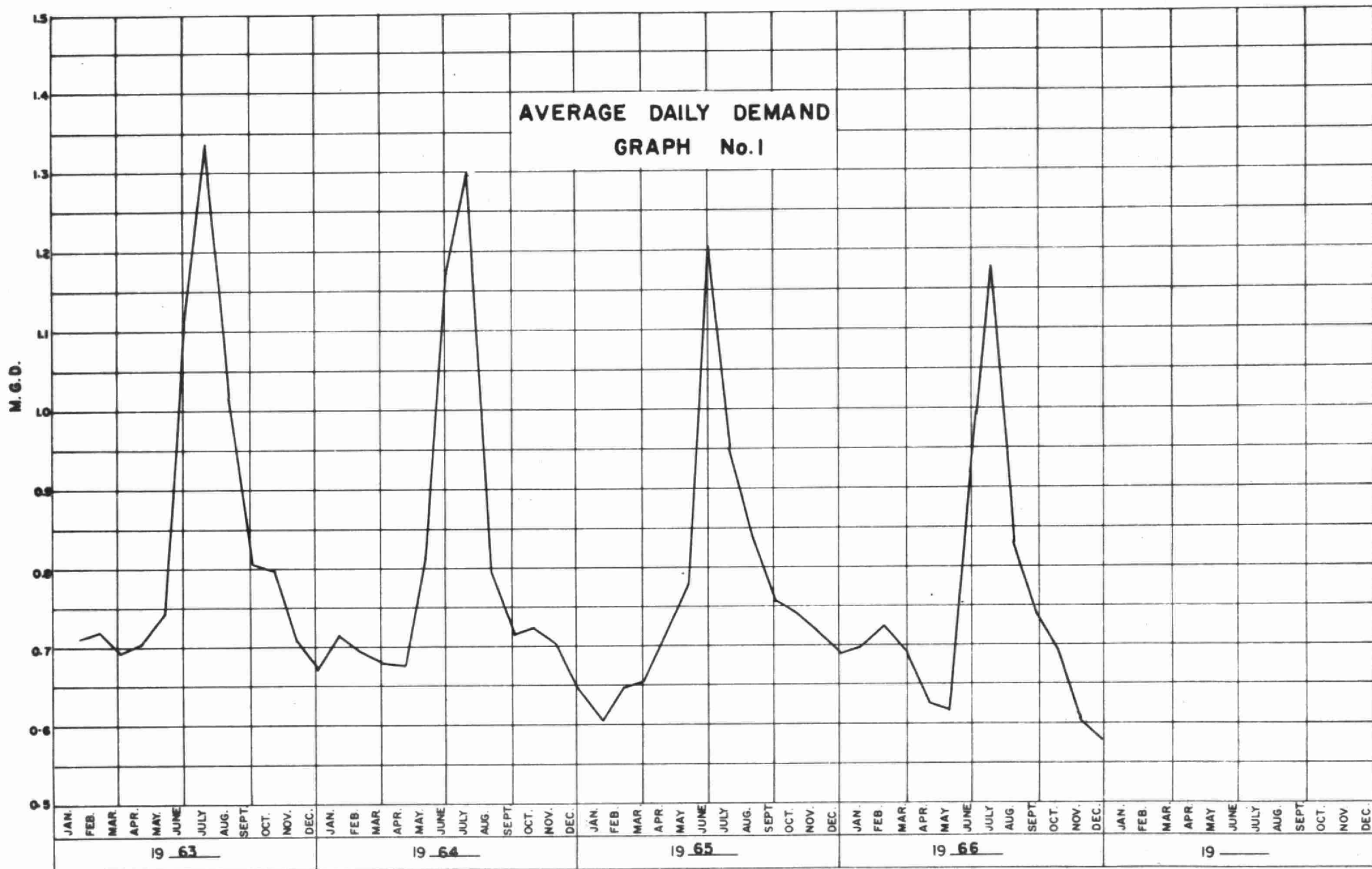
Graph No. 4, shows the dosage of alum required to reduce the turbidity of the raw water. The general practise is to add alum to the raw water whenever its turbidity exceeds 7.0 ppm of silica units. Normally the alum dosage is equivalent to 1 1/4 grains of alum per gallon of raw water. Graph No. 4 shows gallons of liquid alum used. Lime has not been required to date for pH adjustment.

The practise of not using alum when the raw water turbidity drops below 7.0 ppm was abandoned on an experimental basis for part of 1966. This eliminated periods of higher turbidity in the filtered water when alum was not being used.

Graph No. 5, shows that the raw water exceeded the 7 ppm value 55% of the time and is an increase over the 1965 value of 45%.

FLOW DATA

MONTH	TOTAL RAW FLOW MG	BACKWASH		PLANT OUTPUT MG	AVERAGE DAILY MG	MAXIMUM DAILY MG	MINIMUM DAILY MG
		TOTAL MG	% OF RAW				
January	22.477	0.897	4.0	21.580	.696	.795	.576
February	20.971	0.805	3.8	20.166	.720	.771	.675
March	21.588	0.851	3.9	20.737	.689	.750	.585
April	19.685	0.828	4.2	18.857	.629	.754	.465
May	20.436	1.219	6.0	19.217	.618	.760	.470
June	29.083	1.564	5.4	27.519	.917	1.355	.657
July	38.887	2.369	6.1	36.518	1.178	1.643	.905
August	27.794	1.426	5.1	26.368	.851	1.288	.677
September	23.449	1.311	5.6	22.138	.738	1.142	.609
October	22.555	1.104	4.9	21.451	.692	.853	.576
November	18.941	0.920	4.9	18.021	.601	.871	.477
December	18.904	0.920	4.9	17.984	.580	.697	.432
TOTAL	284.770	14.214	-	270.556	-	-	-
AVERAGE	23.731	1.184	5.0	22.546	0.741	-	-





AVERAGE DAILY FLOW (MGD)

ET

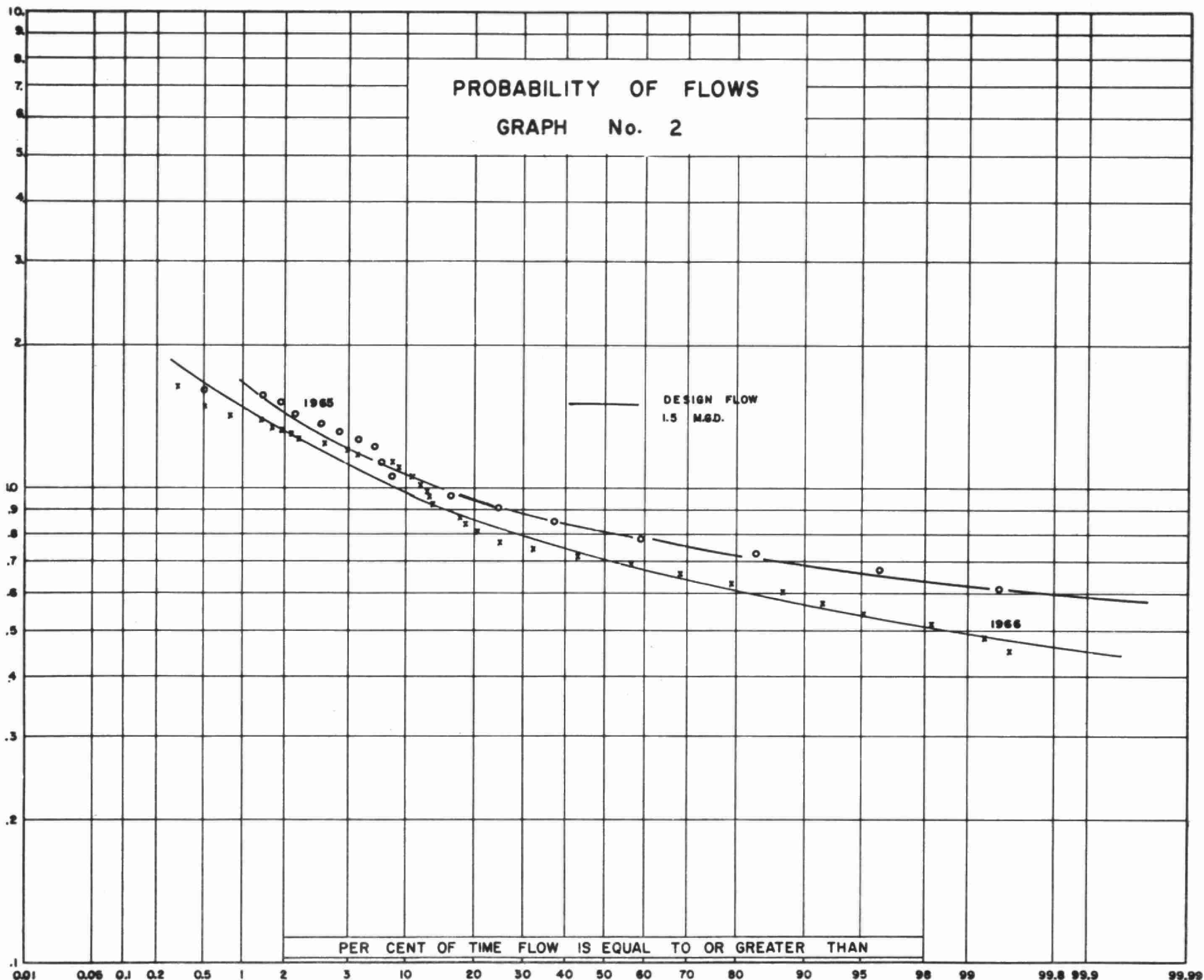
PROBABILITY OF FLOWS  
GRAPH No. 2

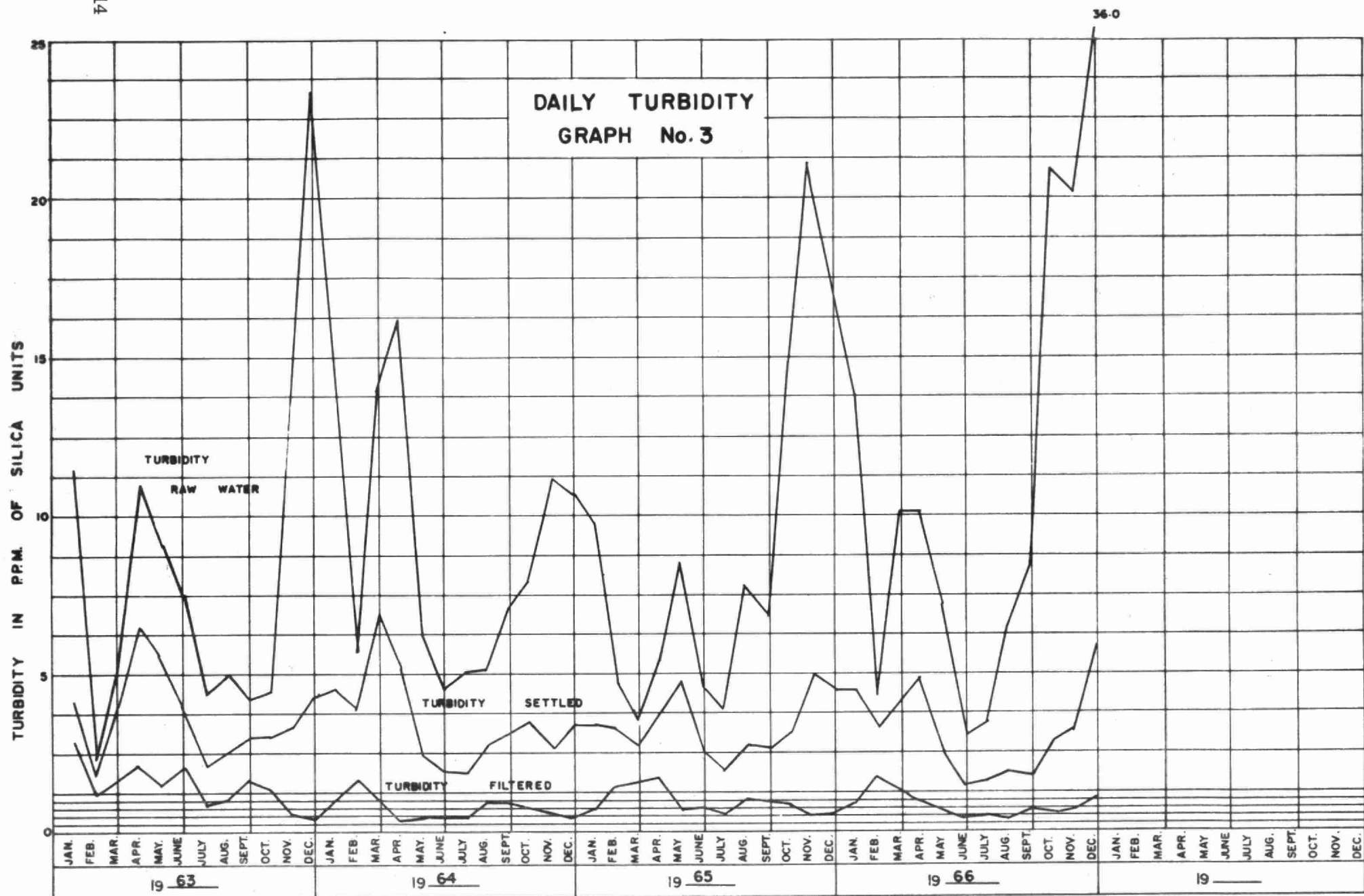
DESIGN FLOW  
1.5 MGD.

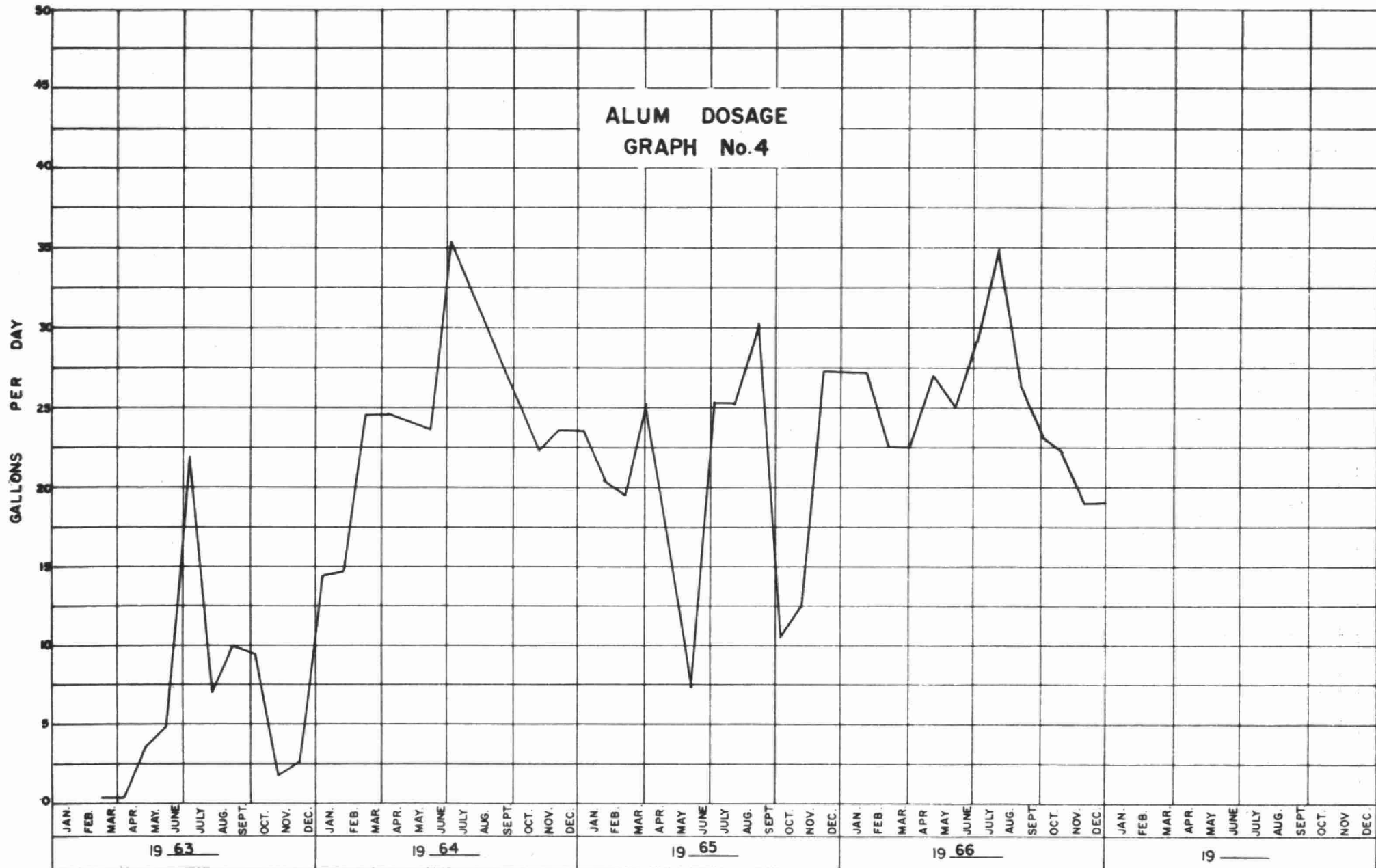
PER CENT OF TIME FLOW IS EQUAL TO OR GREATER THAN

1965

1966

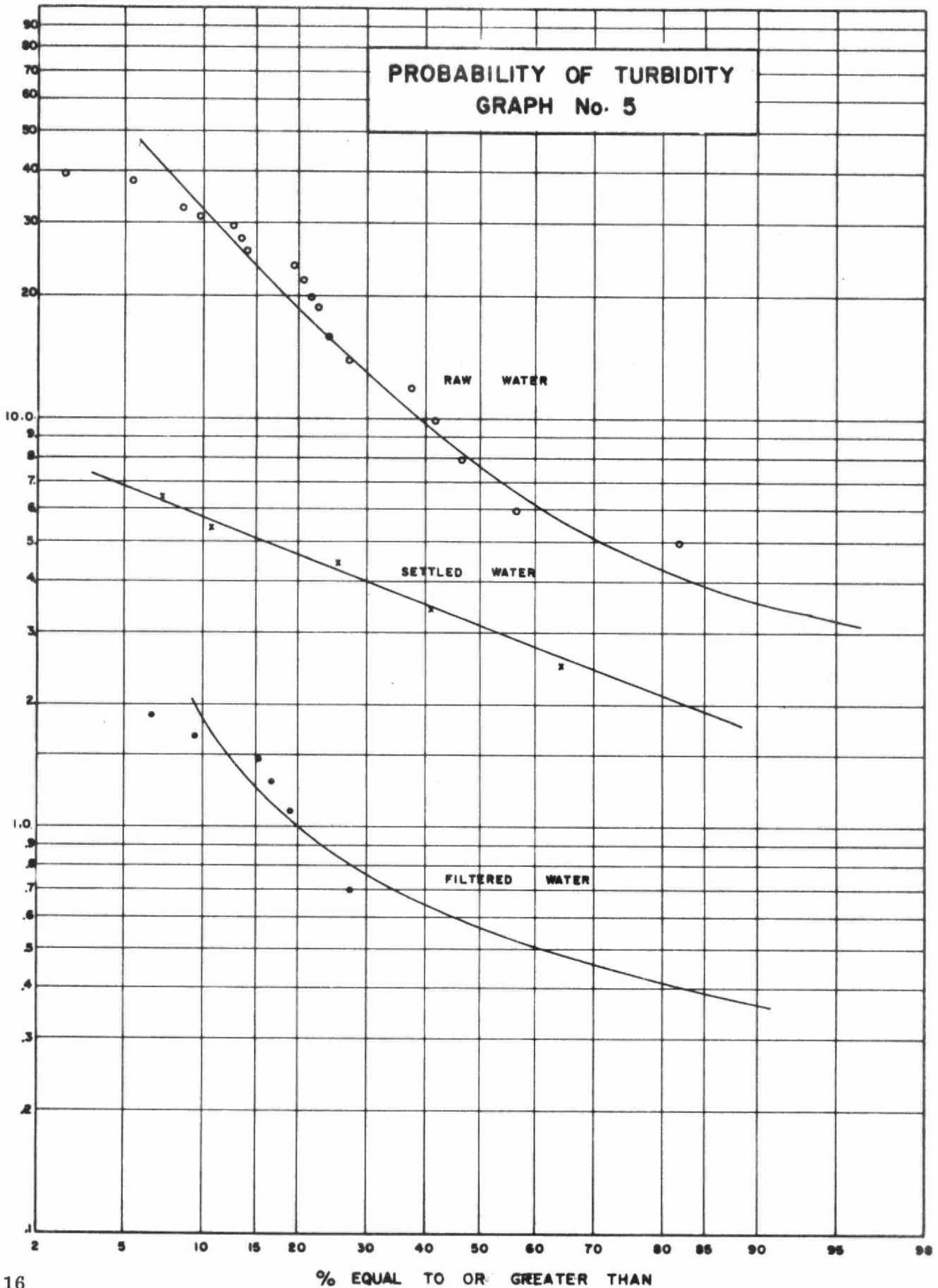






# PROBABILITY OF TURBIDITY GRAPH No. 5

PPM. OF SILICA UNITS



% EQUAL TO OR GREATER THAN

## CHLORINATION

MONTH	PLANT FLOW MG	DOSAGE RATES (PPM)		TOTAL POUNDS CHLORINE	Pre Chlorination	Post Chlorination
		Pre Chlorination	Post Chlorination			
January	22.477	0.97	0.11	241.7	217.3	24.4
February	20.971	0.94	0.11	220.2	197.0	23.2
March	21.588	1.23	0.14	295.6	265.1	20.5
April	19.685	1.17	0.12	255.4	230.8	24.6
May	20.436	0.92	0.06	202.3	189.0	13.3
June	29.083	0.84	0.05	256.9	243.5	13.4
July	33.887	1.05	0.12	398.4	356.2	42.2
August	27.794	1.08	0.18	352.6	301.5	51.1
September	23.449	1.10	0.17	299.4	258.4	41.0
October	22.555	0.96	0.15	252.0	217.7	34.3
November	18.941	0.86	0.11	184.5	163.9	20.6
December	18.904	1.22	0.14	257.7	231.5	26.2
TOTAL	284.770	-	-	3216.7	2871.9	344.8
AVERAGE	23.731	1.01	0.12	268.1	-	-

## COMMENTS

Pre-chlorination of the raw water in 1966 required a dosage rate of 1.01 ppm to maintain a 0.2 ppm residual. This is slightly less than the 1.06 ppm in 1965. Post chlorination dosage averaged 0.12 ppm to maintain the required residual in the final product. Post chlorination dosage is less than the final residual of 0.3 to 0.5 due to a carry over of pre-chlorine. The average use of chlorine was 70 pounds per day, and is down slightly from the 1965 requirements.

Date Due


TD227/G64/W38/1966/MOE  
Ontario Water Resources Co  
Goderich water  
treatment plant : asye  
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## **CONCLUSIONS**

The treated water quality was excellent throughout the year and met OWRC standards at all times. Difficulties were not encountered during the year in supplying an adequate volume of water except on two Sundays on which the staggered lawn watering restrictions did not apply. The plant normally operates well below the design capacity. No major problems were encountered with the equipment.

